



EDEL
Werkzeugmaschinen

Edition 05/2014

5 Axis Performance

**MULTI
MILL**

MULTIMILL in Block Size: the base in 3 axis / (+2=) 5-axis machining



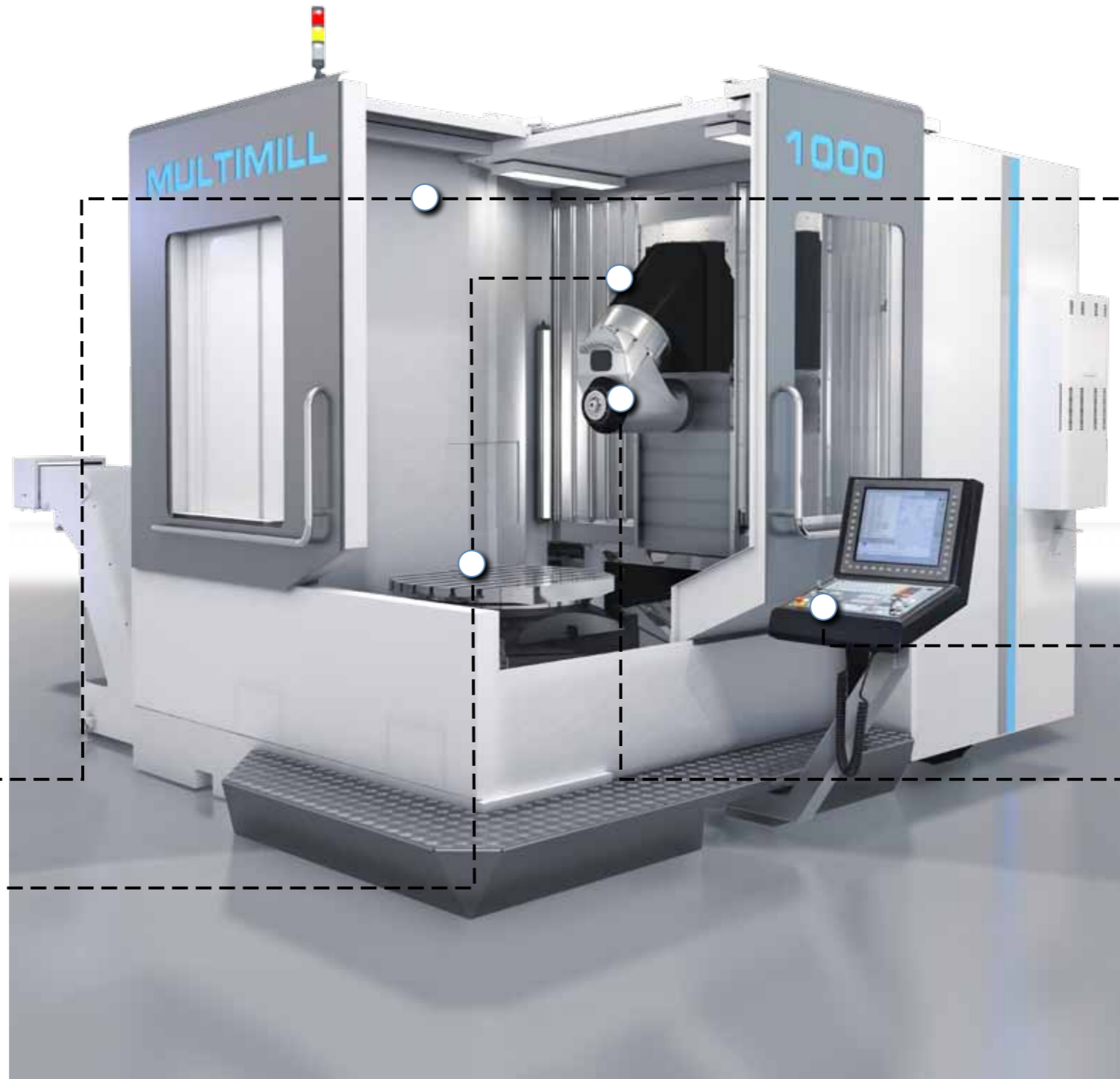
Easily accessible fluid box for high usability

Sophisticated compact design for reduced space requirement / optimal accessibility of the working space / easy loading

Direct driven rotational axes (milling head, rotary table)



Tool changer with substantial tool magazine



Heidenhain control / option: Siemens

Main spindle: individual choice for different machining tasks (milling, turn milling, drilling etc...)



All around safety system according to DIN/EN 12417

...Excellent base for best machining performance and efficiency

Machine concept: the internal values

- Complete machining in one setting for high productivity and flexibility
- Ergonomically optimised machine design for maximum ease for use
- Ideal for tool and mould manufacturer with interchangeable demands in terms of workpiece sizes and numbers

B-axis and rotary table with integrated torque motors and high rigid YRT bearings for 5 axis simultaneous machining.

Tool changer/
big chain magazine with 52 places,
option: shelf magazine with 80 - 150 places

Basic design: feed axes X-/ Y-/ Z incorporates

- Siemens AC servo motors,
- ball bearing screws and
- Schneberger linear guides for high acceleration
- Heidenhain precision scales (in X, Y, Z) and absolute encoders (B and C) for most precise position detection

Drive motor Y axis

Drive motors X/Z axes

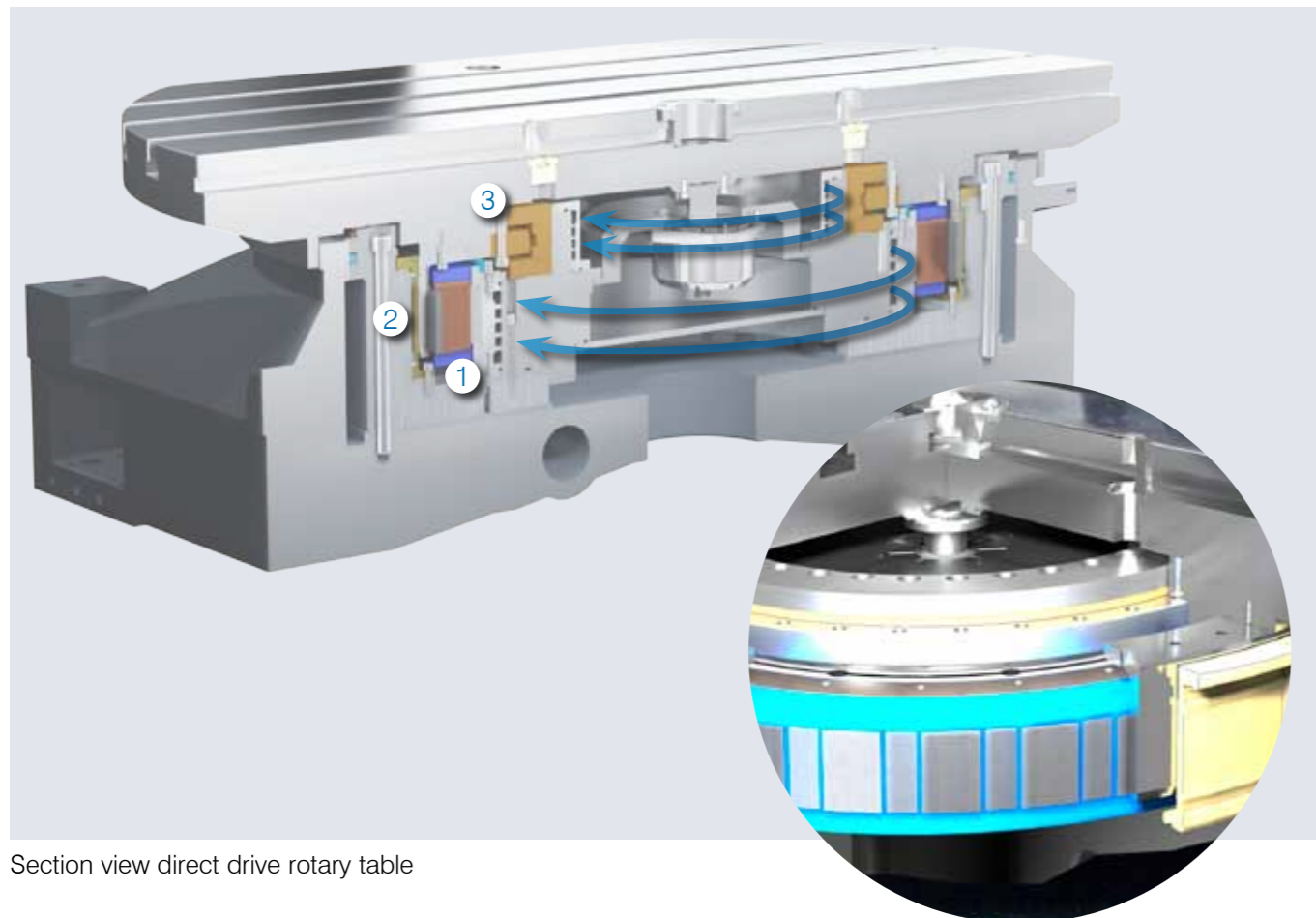
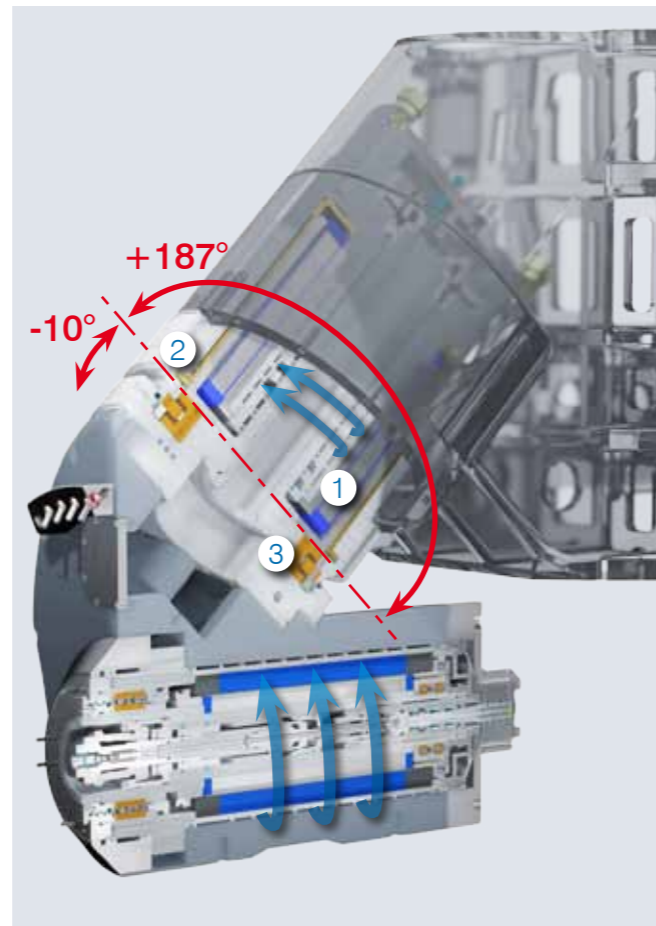
Efficient cooling technology for reproducible repeatability and high thermal stability

High rigid monoblock machine body in cast design for the pickup of high workpiece weight

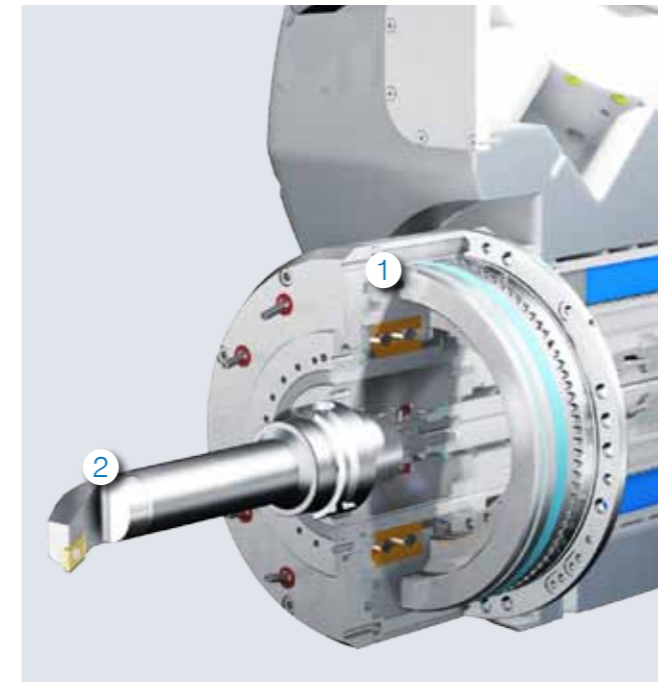
High performance chip disposal by means of chip conveyors and spiral

NC rotary table and NC milling head:

- Free of wear gearless direct drive with torque motors (1)
- High angular acceleration by means of high torque combined with extremely short positioning times
- Integrated clamp function by means of distortion-free hydraulically operated clamping bushes, e. g. for rough machining tasks (2)
- High bearing rigidity of the planar disk (rotary table) and of B axis (milling head) by means of free from backlash preloaded axial/radial bearings (3)
- Highly precise absolute value encoders for optimised position control
- High dynamic NC rotary table with 50 rpm, (option: turning up to 350 rpm).
- Powerful cooling technology (→) integrated to the spindle, head and table drives



Section view direct drive rotary table

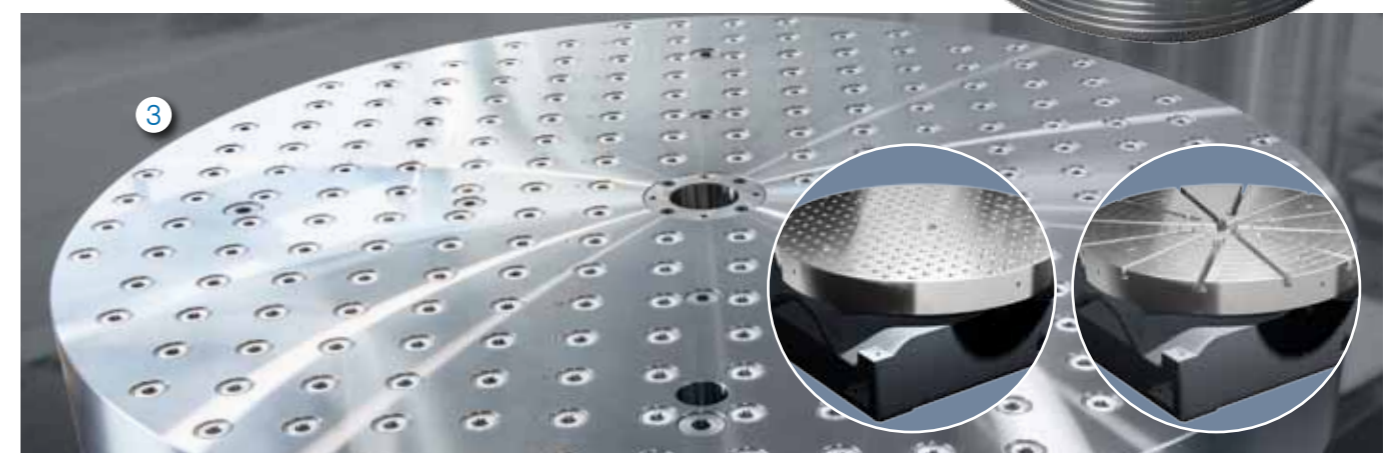


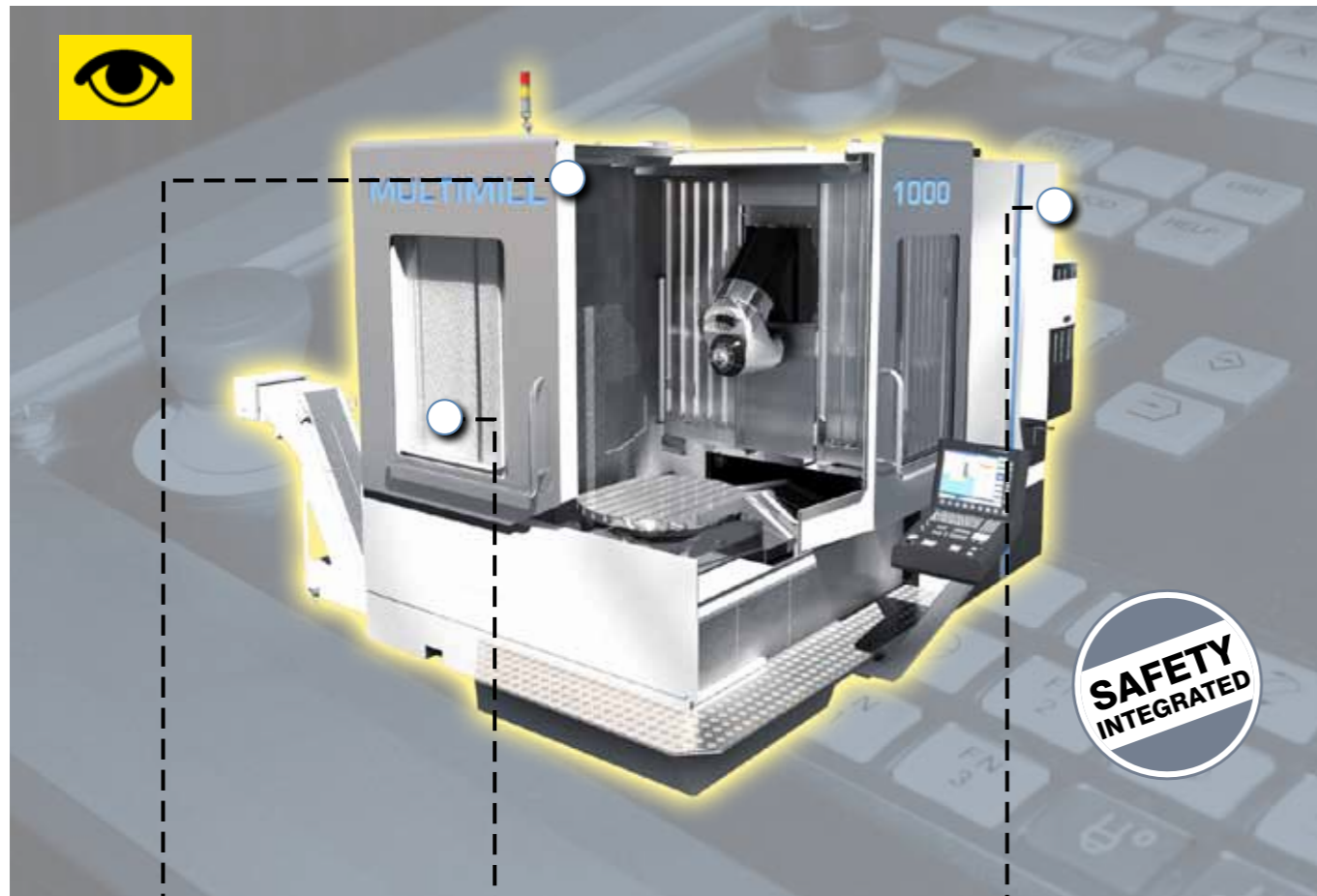
Turn-milling sets standards for economical, precise and appropriate customer solutions.

The new clampable synchronous spindle is equipped with a Hirth serration (1). With this, the whole system rigidity of B axis and spindle is transferred to the turning tool (2). In released condition the spindle unfolds its complete power for milling and drilling tasks.

The direct driven rotary table with up to 350 rpm can be equipped with a new plate with holes in grid pattern (3), that offers unique clamping options for turned parts.

So with complete machining part production times can be reduced significantly during one clamping, while the productivity is increased.





Comprehensive modern safety devices, according to the European safety norm for tool machines DIN EN 12417

- Euchner security switches for door locking (1)
- Optional safety controls (2) of the German manufacturers
PILZ | Heidenhain | Siemens Safety with additional monitoring control
- Hybrid machine glazing (3)
with high retention capacity | puncture- and scratch-proof | resistant against coolant
- monitoring of control circuits of the linear and rotational axes and of the spindle
- CE identification, declaration of conformity.



Standard: Heidenhain TNC 530 HSCI

- HSCI - HEIDENHAIN Serial Controller Interface
- Shop or DIN/ISO-programming
- Fastest program editing by means of cleartext programming
- Graphic programming
- High performance processor (1,8 GHZ) and regulator
- Significantly higher speed during program process for very good surfaces, interpolation time approx. 0,5 ms

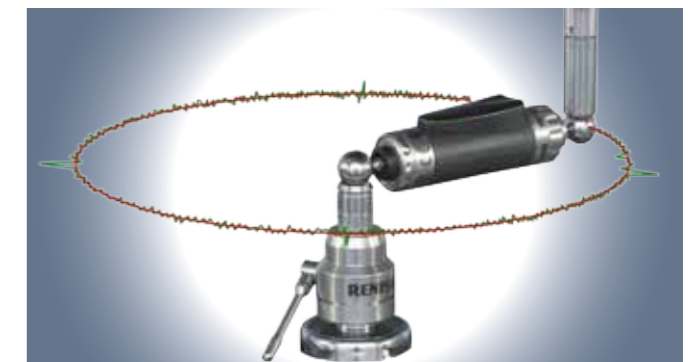
Option: Siemens 840D solutionline

- Easiest interactive programming for turning and milling
- High performance processor (1,85 GHZ)
- Graphic programming (Operate)
- Look Ahead
- High Speed Settings
- TRAORI - 5-axes package
- Graphic simulation of the machining process with top view, display in three layers and 3D-display
- Sinumerik Safety Integrated



Maximum precision in the machining result:

The examination and analysis of the machine accuracy is essential to achieve a constant and repeatable level of process security. For this, EDEL uses modern Renishaw laser technique.



Roundness test:

This detects the roundness deviation of the machine, positioning accuracy and regulation settings are checked and optimised



Autom. gauging and correction of the kinematic accuracy

Machining examples



Die insert, finishing 18.000 rpm



Pelton wheel 1.4313 forged, preroughing 170 Nm



Automotive technology: motor block V8, finishing with cutter head $\varnothing 100$ mm



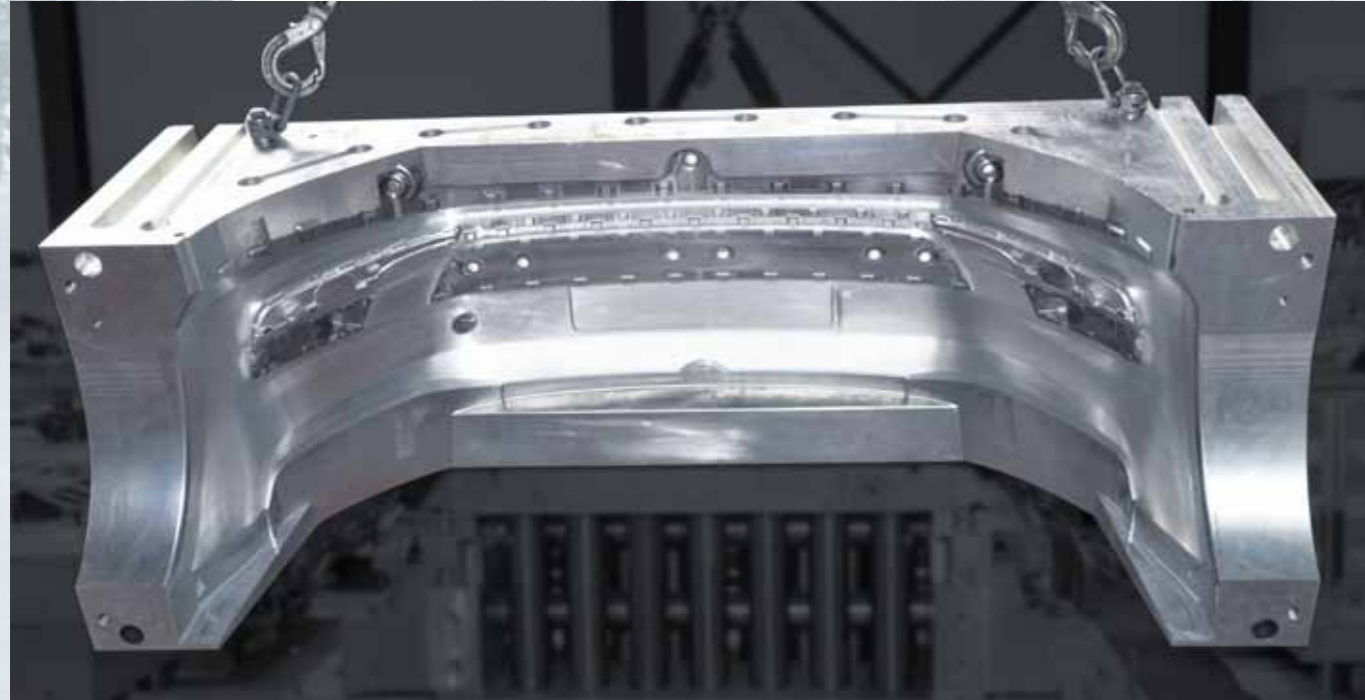
Bumper mould AlMgSi, High power milling 60 kW, 15.000 rpm, finishing 20.000 rpm



Mechanical part Ck45, 700 cm³/min, 170 Nm/27 kW



Geared rim, hard machining 12.000 rpm



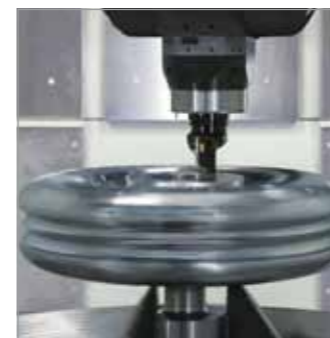
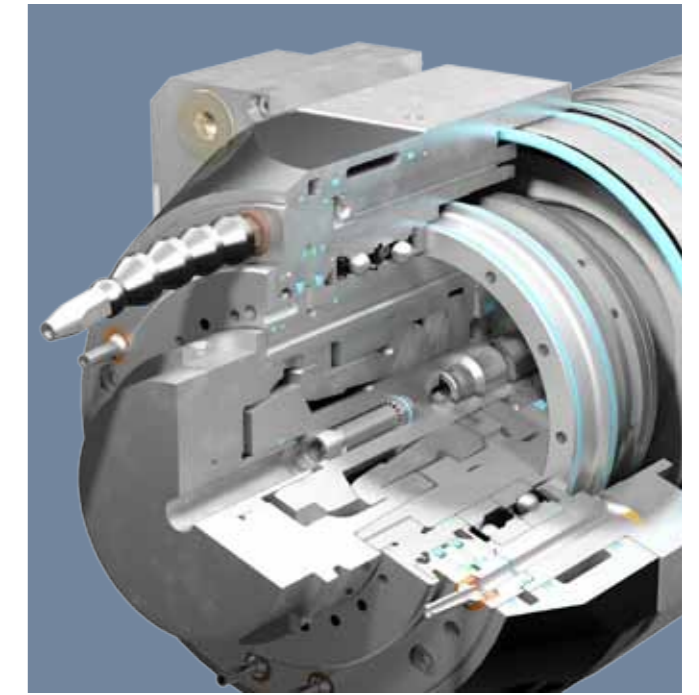
Die casting mould, 40 CrMnMo7, cherry $\varnothing 6$ mm, 18.000 rpm, 130 Nm



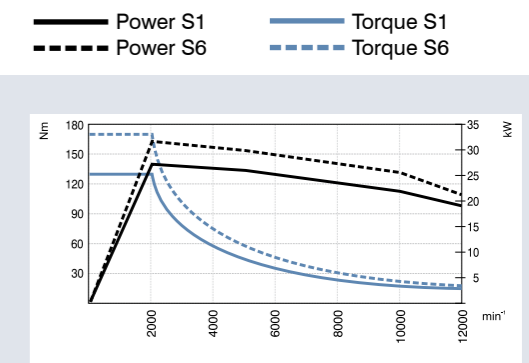
Travel range axes	X / Y / Z	1.000 / 800 / 700 mm
Working range spindle	Vertical distance spindle nose - table top	113 - 813 mm
	Horizontal distance spindle nose - table center	50 - 750 mm
Feed force	X / Y / Z	8000 N
Feed speed	Rapid traverse X / Y / Z	40 m/min
	Acceleration	4 m/s ²
Milling head	Swivel range	-10 up to +187°
	Max. speed	60 rpm
	Torque max.	1.000 Nm
	Clamping torque	4.000 Nm
Tool magazine	Positioning accuracy	+/- 5"
	Tool places	52 (optional max.150)
	Tool weight max.	8 kg
Rotary table	Tool length max.	300 mm
	Face plate dimensions	1.000 x 800 mm (optional Ø 900 mm)
	Table load max. (central)	2.000 kg
	Max. speed	50 - 100 rpm (optional 350 rpm)
	Positioning accuracy	+/- 5"
Accuracies acc. VDI / DCG 3441	Clamping torque	4.000 Nm
	Torque max.	1.600 Nm
	Linear axes X / Y / Z	P*: 0,009 mm / Ps**: 0,007 mm
Distance measurement	all axes X / Y / Z / B / C	direct, absolute encoder (Heidenhain)
Machine control	Heidenhain iTNC 530 HSCI, optional Siemens Sinumerik 840 D SL	
Setting-up data	Place requirement X / Y / Z (each without coolant device)	3.970 / 3.700 / 3.000 mm
	Machine weight	15.000 kg
	Total power input	80 KVA
	Mains connection	3 x 400 V / 50 Hz
	Compressed air supply	5 bar
Chip disposal	in X-direction	Drag link or slat band conveyer
	in Y-direction	Spiral conveyer (2 pcs.)
	Capacity of paper band filter device	950 litres
	Coolant pressure CTS / ECS	60 / 20 bar
Options	Filter performance	150 litres/min
	Workpiece measuring	Blum (optional others)
	Tool measuring	Blum (optional others)
	Emulsion separator	W&W
	Spray gun	
	Rotating inspection glasses	

The accuracy strongly depends on the external thermal influences. The indicated values refer to a temperature range of 20° +/- 2°.

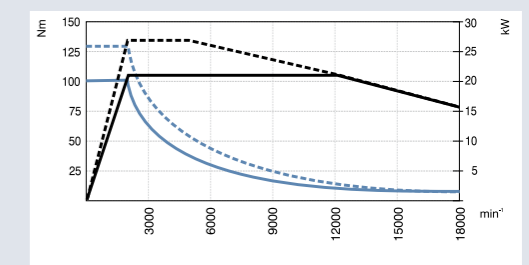
*: Positioning accuracy
 **: Positioning scatter band



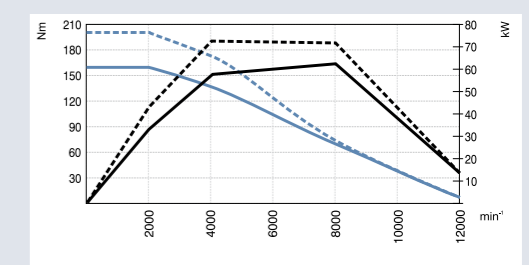
The allrounder (opt. turning)
 27 kW / 170 Nm / 12.000 rpm

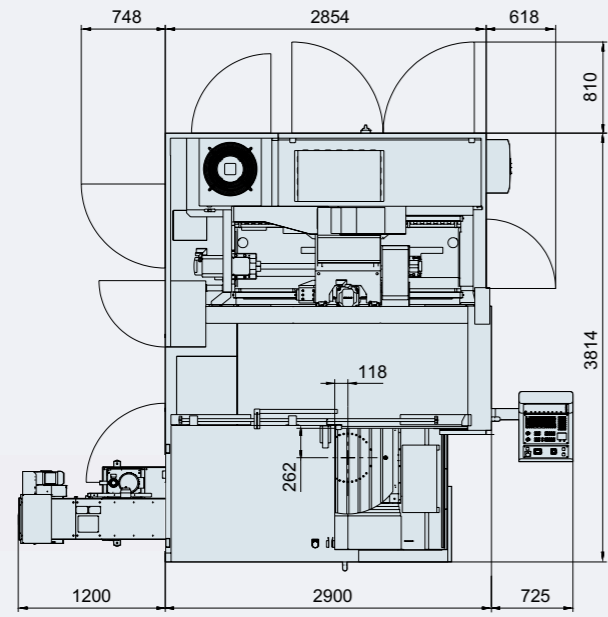


The finisher
 21 kW / 130 Nm / 18.000 rpm

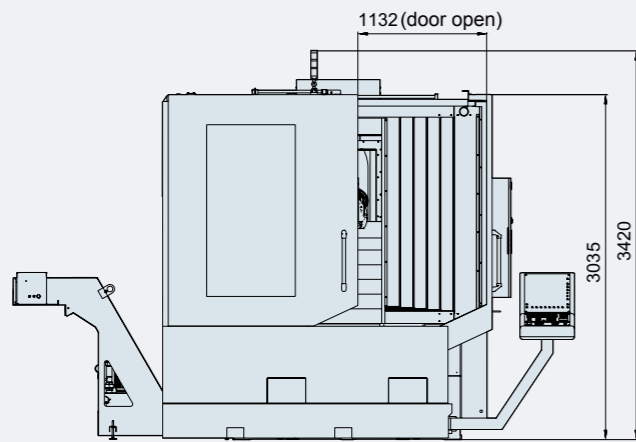


The rough cutter
 34 kW / 220 Nm / 12.000 rpm

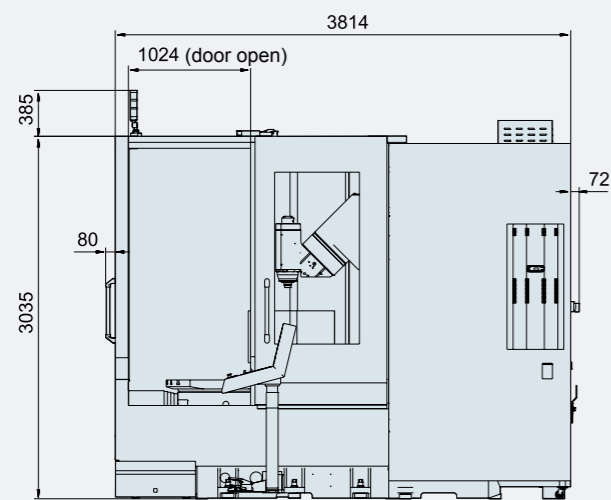




Top view

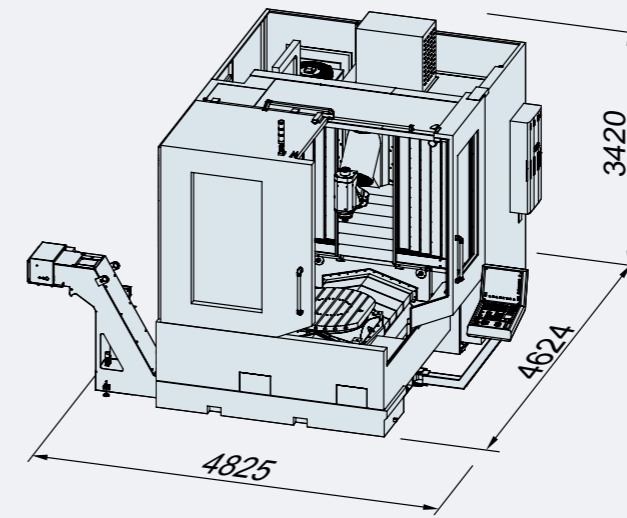


Side view



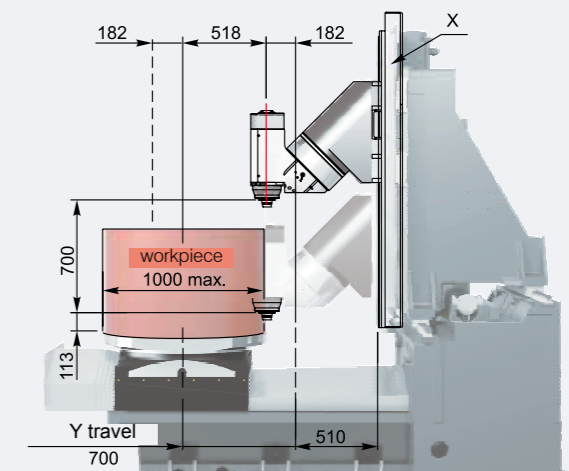
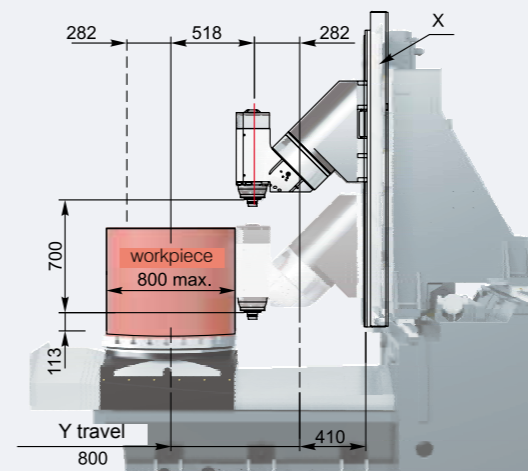
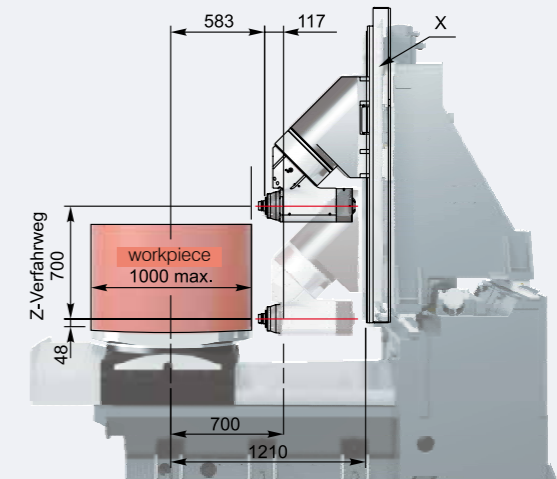
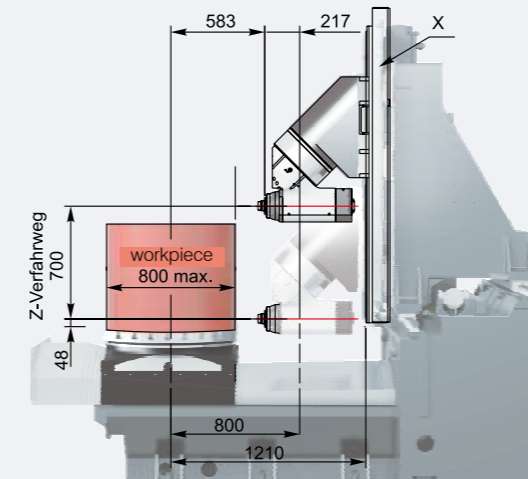
Front view

Dimensions for basic machine without chip conveyor and coolant device



Big working space:

Thanks to the diagonal accessibility and shiftable front and side door also bigger workpieces (max. diameter 1000 mm) can be clamped easily and fast. In vertical spindle position the total plate surface can be reached.



The alternative in XL: MULTIMILL 1600

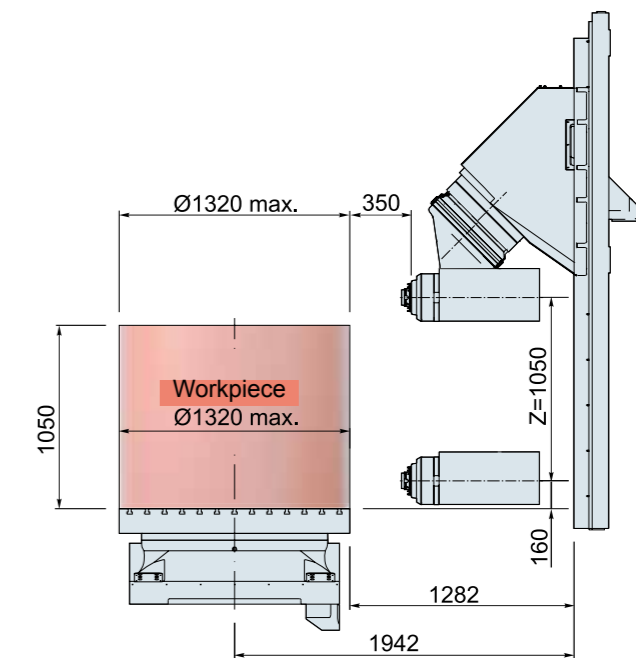
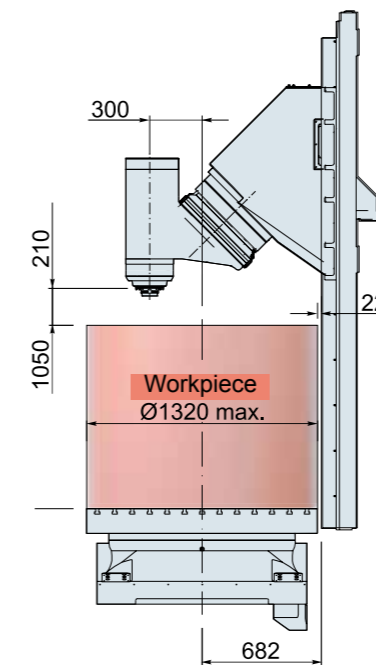
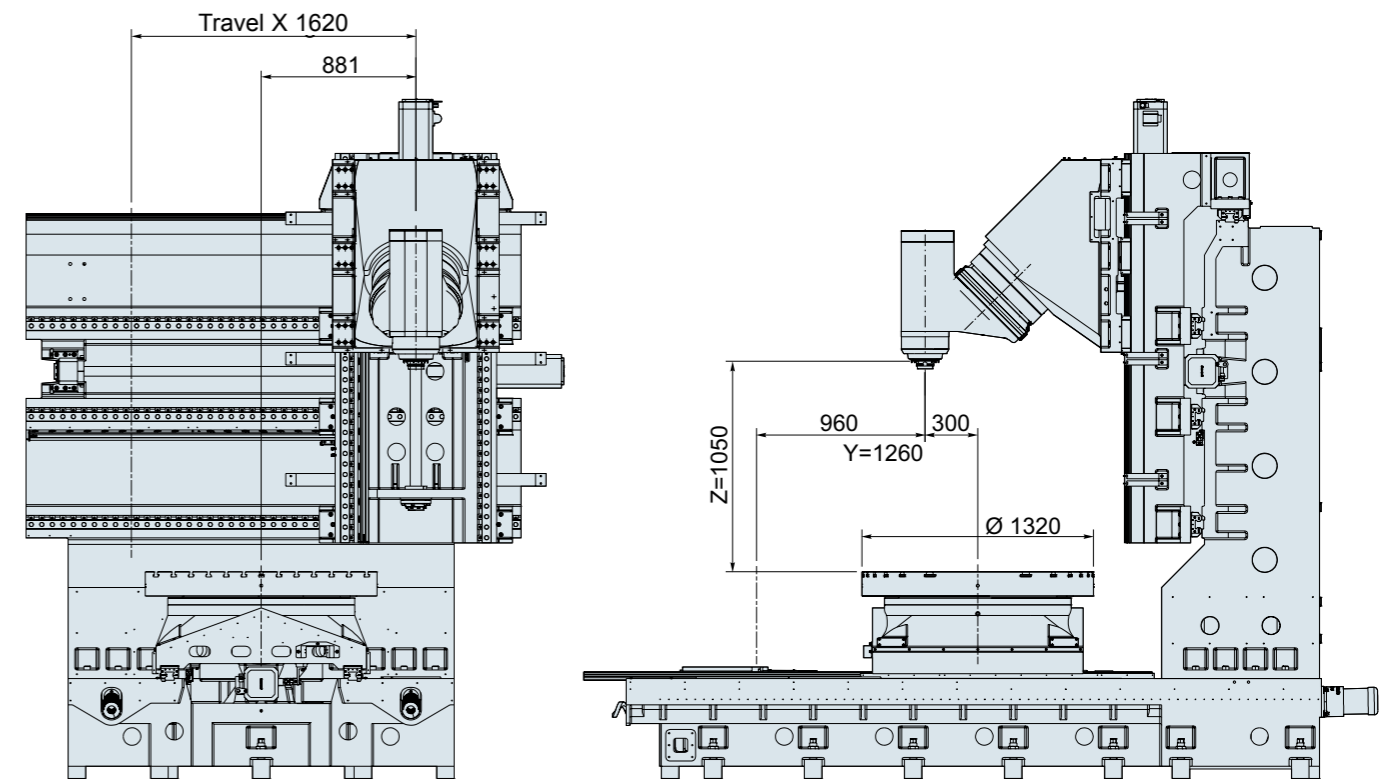
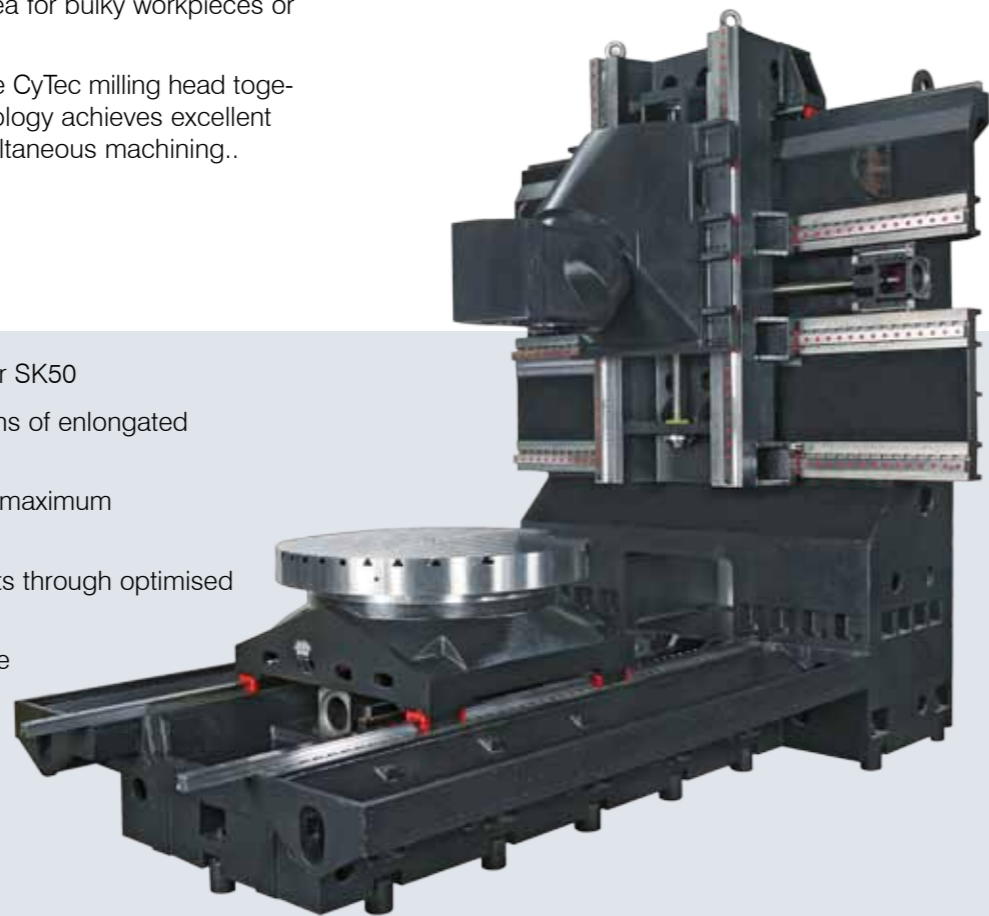


The large version of Multimill with longer travel distances and higher table loads offers not only classical drilling and milling operation, but in addition also turning in one setting. The X axis is equipped with fourfold guiding slides which guarantees constant rigidity over the whole travelling distance.

The cubic workspace offers area for bulky workpieces or multiple clamping devices.

The high torque (500 Nm) of the CyTec milling head together with mature spindle technology achieves excellent preconditions for five axis simultaneous machining.

- Tool interfaces HSK-A100 or SK50
- Big working space by means of elongated X axis
- Fourfold guided X slide for maximum rigidity
- Extended workpiece weights through optimised machine design
- Highest milling performance



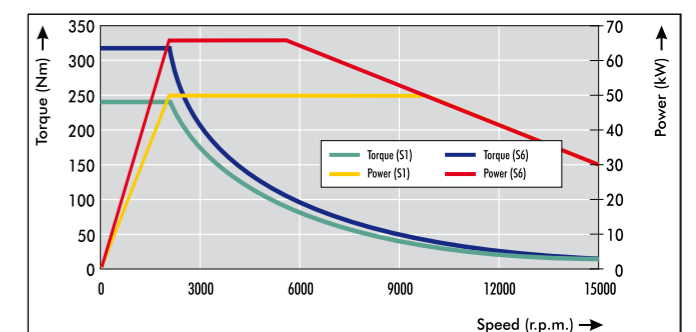
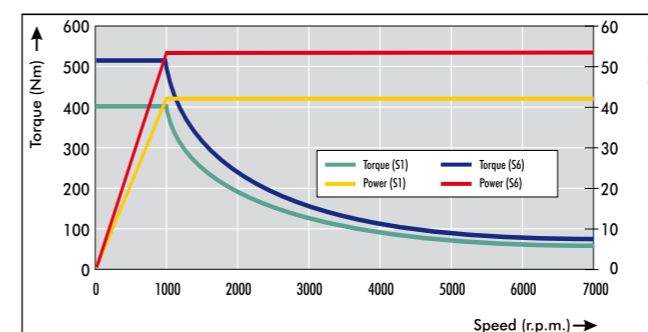


Travel range axes	X / Y / Z	1.620 / 1.260 / 1.050 mm
Working range spindle	Vertical distance spindle nose - table top	200 - 1.250 mm
	Horizontal distance spindle nose - table center	100 - 1.150 mm
Feed force	X / Y / Z	22.700 / 28.200 / 30.300 N
Feed speed	Rapid traverse X / Y / Z	24 m/min
	Acceleration X / Y / Z	3,5 / 3,2 / 3 m/s ²
Milling head	Swivel range	-2 up to +182°
	Max. speed	160 rpm
	Torque max.	2.880 Nm
	Clamping torque	6.000 Nm
Tool magazine	Positioning accuracy	+/- 0,001°
	Tool places	60
	Tool weight max.	20 kg
Rotary table	Tool length max.	350 mm
	Face plate dimensions	Ø 1.320 mm
	Table load max. (central)	4.000 kg
	Max. speed	80/200 rpm
	Positioning accuracy	+/- 0,001°
Distance measurement	Clamping torque	10.000 Nm
	Torque max.	4.500 Nm
	all axes X / Y / Z / B / C	direct, absolute encoder
Machine control	Heidenhain iTNC 530 HSCI, option: Siemens Sinumerik 840 D SL	
Setting-up data	Place requirement X / Y / Z (each without coolant device)	5.200 / 4.900 / 4.100 mm (including chip conveyer)
	Machine weight	25.000 kg
	Total power input	100 KVA
	Mains connection	3 x 400 V / 50 Hz
	Compressed air supply	5 bar
Chip disposal	in X-direction	Drag link or slat band conveyer
	in Y-direction	Spiral conveyer (2 pcs.)
	Capacity of paper band filter device	1.200 litres
Options	Coolant pressure CTS / ECS	60 / 20 bar
	Filter performance	200 litres/min
	Workpiece measuring	Blum
	Tool measuring	Blum
	Emulsion separator	W&W
	Spray gun	
	Rotating inspection glasses	



CS 42-238-S (Standard)	
Nom. power S1 (kW):	42
Max. torque S6 (Nm):	525
Max. speed (rpm):	7.000
Tool interface:	HSK-A100

CS 50-238 (Option)	
Nom. power S1 (kW):	50
Max. torque S6 (Nm):	324
Max. speed (rpm):	15.000
Tool interface:	HSK-A100





Production hall in Jülich



Service center
in Pliezhausen

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